Original article

The Relationship Between Serum Lipid Levels and Benign Prostatic Hyperplasia

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ÖZET
Serum lipid değerleri ile benign prostat hiperplazisi arasındaki ilişki

Yaşlı erkeklerde benign prostat hiperplazisi (BPH) prostatın malign olmayan hastalıkları içinde en yaygın olanı olmasına rağmen etiyolojisi ve patofizyolojisi henüz tam olarak anlaşılabilmiş değildir. Bu nedenle biz de BPH hastalarındaki serum lipid değerleri ile prostat boyutları arasındaki ilişkiyi araştırdık.

Semptomatik benign prostat hiperplazisi olan 37 hasta ile yaşça farklı olmayan ve herhangi bir alt üriner sistem şikayeti olmayan 43 sağlıklı olgu bu çalışmaya dahil edildi. Çalışmaya alınan bütün olgular fizik muayene, uluslararası prostat semptom skoru (IPSS), serum lipid değerleri, prostat spesifik antijen (PSA) ve abdominal ultrasonografi ile değerlendirildi.

Çalışmaya alınan BPH hastalarının ve sağlıklı kontrol grubunun prostat büyüklükleri sırasıyla 53,5±12,6 g ve 45,6±12,1 g idi. Hasta grubu (205,7±31,9) ile kontrol grubunun (189,2±35,3) ortalama total kolesterol konsantrasyonları karşılaştırıldığında aralarında istatistiksel olarak anlamlı fark olduğu gözlendi (p=0,03). Hastaların ortalama PSA değerleri 2,3±2,02 idi ve kontrol grubunun PSA değeri olan 1,1±1,0 değerinden farklı bulundu (p=0,002). Sonuç olarak kontrol grubu ile karşılaştırdığımızda prostat boyutları, PSA ve total kolesterol konsantrasyonunu BPH hastalarında daha yüksek bulduk.

Anahtar Kelimeler: Prostat, benign prostat hiperplazisi, serum lipidleri, prostat spesifik antijen

ABSTRACT

Although benign prostatic hyperplasia (BPH) is the most common non-malignant condition of the prostate in aging men, little is known about its aetiology and pathophysiology. Thus, we evaluated serum lipid profile in BPH cases and their association with prostate size.

Thirty-seven consecutive symptomatic cases of BPH and fourty-three age-matched healthy controls who did not have any lower urinary tract symptoms were included in this study. All the participants had undergone a urological investigation which included International Prostate Symptom Score (IPSS), prostate specific antigen (PSA) and prostate volume measured with transabdominal ultrasonography. Serum lipid concentrations of the subjects were also determined.

The mean prostate size of patients in the study group was 53.5±12.6 g and 45.6±12.1 g for subjects in control group (p=0.005). The comparison of the mean total cholesterol concentration between the study (205.7± 31.9) and the control groups (189.2±35.3) revealed a significant difference (*p*=0.03). The mean PSA of patients was 2.3±2.02 and 1.1±1.0 for subjects in control group (*p*=0.002). We found that prostate size, PSA, and total cholesterol concentrations were significantly higher in BPH cases compared to controls.

Key Words: Prostate, benign prostatic hyperplasia, serum lipids, prostate specific antigen

INTRODUCTION

Although benign prostatic hyperplasia (BPH) is the most common non-malignant condition of the prostate in aging men, little is known about its aetiology and pathophysiology[1].Previous studies have primarily focused on sex steroid hormones. However, results of studies also indicate that modifiable risk factors of cardiovascular disease such as elevated fasting plasma glucose levels[2-3], diabetes[2,4], obesity[2,5-6], and the metabolic syndrome[7] might also increase the risk of BPH and potentially contribute to its development. Changed lipid metabolism has been reported in prostatism but there are not a great number of study investigating the relationship between serum lipid levels and BPH. Thus, we evaluated serum lipid profile in BPH cases and their association with prostate size.

PATIENTS AND METHODS

Thirty-seven consecutive symptomatic cases of BPH and fourty-three age-matched healthy controls who did not have any lower urinary tract symptoms were included in this study. All the participants had undergone a urological investigation which included International Prostate Symptom Score (IPSS), serum PSA and lipid concentrations and determination of prostate volume with transabdominal ultrasonography. No single definition of BPH has gained universal acceptance in clinical or epidemiological studies. BPH has been variably defined as prostatic enlargement, histologic hyperplasia, lower urinary tract symptoms, diminished uroflow or urodynamic obstruction. We used the more acceptable clinical definition of BPH in the literature that IPSS was greater than seven[8].

Prostate specific antigen (PSA) serum total cholesterol, triglyceride, high-density lipid (HDL),

and low-density lipid (LDL) determinations were quantified. Serum samples were collected if the patients were fasting at least 12 h. A commercially available statistics software package (SPSS for Windows v. 15.0, Chicago, USA) was used to perform all statistical calculations. The means were compared by using Student's t test. The results were expressed as means±standart deviation (SD). p values <0.05 were considered as statistically significant.

RESULTS

Age, prostate size, PSA, fasting serum lipid profile and glucose parameters in symptomatic BPH cases and controls are summarized in Table 1. The 37 patients with BPH and the 43 men used as a control population had a mean (SD, range) age of 56.7 (7.3, 45–78) and 56.5 (8.3, 41-75) years, respectively (p=0.91). The mean prostate size of patients in the study group was 53.5±12.6 g and 45.6±12.1 g for those in control group (p=0.005). The comparison of the mean total cholesterol concentration between the study (205.7±31.9) and the control groups (189.2±35.3) revealed a significant difference (p=0.03). The mean PSA of patients was 2.3±2.0 and 1.1±1.0 for those in control group (p=0.002).

Table 1. Means and standard deviations of evaluated parameters in BPH patients and controls

Parameters	BPH (n=37)	Control (n=43)	P*
Age	56.7±7.3	56.5±8.3	>0.05
Glucose	92.5±8.9	89.6±9.6	>0.05
Total cholesterol	205.7±31.9	189.2±35.3	0.03
Triglyceride	157±91.3	125±57.7	>0.05
HDL-cholesterol	36.7±4.9	38.4±7.6	>0.05
LDL-cholesterol	129.8±31.9	125.7±31.7	>0.05
PSA	2.3±2.0	1.1±1.0	0.002
Prostate size	53.5±12.6	45.6±12.1	0.005

* According to Student's t test

DISCUSSION

We performed a prospective study to determine a possible relationship of serum lipid concentrations and BPH. For this purpose, we compared the serum lipid levels, PSA, and prostate size between the patients with BPH and the age-matched controls. We found that prostate size, PSA, and total cholesterol were significantly higher in BPH cases as compared to controls.

Previous studies have demonstrated that abnormal lipid profile can lead to prostatism[9] and hypothesized that dyslipidemia is a risk factor in the development of BPH[10-11]. In the present study, the results are consistent with previous researches. On the other hand, it has been reported in other studies on this issue that there was no

relationship between clinical BPH and serum lipid levels[3,8].

Nandeesha et al.[12] found that total cholesterol and LDL-cholesterol were significantly higher and HDL-cholesterol was significantly lower in BPH cases compared to controls. They reported that insulin had a significant regression with cholesterol, triglycerides, LDL cholesterol and VLDL cholesterol and insulin is claimed to be involved in pathogenesis of BPH through its action on sympathetic nerve activity, sex hormones and IGF (insulin-like growth factor) axis. They suggested that dyslipidemia in BPH occurs due to insulin resistance and insulin plays role in promotion of prostate growth, as it has been established as growth promoting hormone.

The metabolic syndrome which is characterized by a defect in the insulin-mediated glucose uptake is mainly localized to the muscle, adipose tissue and the liver of these patients, leading to an insulin resistance and a secondary hyperinsulinemia. Hence, the present study might indicate the possibility that BPH patients might have the same primary metabolic abnormality of a defective insulin-mediated glucose uptake and secondary hyperinsulinemia as patients with the metabolic syndrome[13-14]. On the other hand, Lekili et al. reported that there was no correlation between prostatism and serum lipids, and obesity is not a risk factor for enlargement of prostate and the severity of symptoms[8]. According to their explanation lower body mass index is associated with higher serum testosterone levels whereas oestrogen levels are higher in obesity[15-16]. Obese men produce more oestradiol and oestrone than nonobese men through transformation of adrenal androsteneodione in adipose tissue, a transformation that results in higher endogenous oestrogen levels[17].

The studies about the relationship between serum lipid levels and BPH are conflicting. For that reason, researches relating BPH associated with serum lipids and hormones will be of great interest in future. In the present study, there was statistically significant relationship between serum total cholesterol levels and BPH.

As a conclusion, in this prospective study we found that prostate size, PSA, and total cholesterol concentrations were significantly higher in BPH cases compared to controls. While there are possible pathophysiologic explanations, the underlying mechanisms have yet to be identified with further experimental and epidemiological researches to confirm our results.

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Arrival date   : 01.03.2010
Acceptance date   : 02.04.2010